ABSTRACT OF THE DISCLOSURE

A scanning probe microscope has a cantilever having a probe at a distal end thereof and an oscillator for generating a resonance signal near a resonance of the cantilever. A vibrating device receives the resonance signal as a driving signal for vibrating the cantilever. A variable gain amplifier adjusts a gain of a displacement signal corresponding to displacement of the vibrating cantilever so as to satisfy the equation $G=(A/A_0)*G_0$ to control a quality factor value of the cantilever resonance to an optimal quality factor value, where G represents a gain value of the variable gain amplifier, A represents a preselected oscillation amplitude of the oscillator, A_0 represents an initial oscillation amplitude of the oscillator, and G_0 represents a gain value of the variable gain amplifier when the initial oscillation amplitude of the oscillator is A_0.